TESTICULAR NEOPLASMS: FACTORS THAT RELATE TO CLINICAL PRACTICE AMONG HEALTH CARE PROFESSIONALS

by

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ABSTRACT

This study evaluated 39 physician's, nurse practitioner's and physician assistant's knowledge and attitudes on the subject of testicular cancer to determine whether these factors affected diagnosis and intervention. Descriptive and correlational analysis of results showed moderate levels of knowledge for all groups. Attitudes were positive on the need for early detection. Clinical practice scores were improper for 92% of the sample. Knowledge scores were positively correlated with clinical practice scores.

This study showed a lack of basic knowledge and proper clinical practices despite positive attitudes on early detection. Application of findings lies in altering basic educational approaches to the male urogenital system. Dissemination of the results of this study may also institute change among practicing clinicians.

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CHAPTER I

INTRODUCTION AND REVIEW OF THE LITERATURE

Introduction

Cancer is a disease feared by all mankind. The word cancer, derived from the Latin, crab, describes the erratic growth of cells that become fiercely independent, divide and reproduce without functional purpose or regard for normal tissues.

One out of four people will develop cancer in their lifetime (American Cancer Society, 1980). The number of deaths from cancer are outnumbered only by those related to cardiovascular disease (Calman, 1978). Cancer kills over 300,000 Americans a year and contributes significantly to the skyrocketing costs of medical care in this country (Richards & Holcombe, 1980).

The staggering statistics on the incidence and economic strain of cancer on individuals and society stresses the need for effective intervention in the areas of prevention, early detection, and treatment of malignancies. These interventions can be enhanced through proper health practices on the part of both the

patient and health care provider.

Americans, according to an American Cancer Society survey in 1978, are doing more to protect themselves against cancer than ten years ago. Ten percent of the population visit health care providers for physical examinations aimed at early cancer detection. A study by Stromborg and Bourque-Nord (1979) showed that 62.1% of patients attending a cancer detection clinic did so because of a belief in the value of the annual cancer check-up. However, public recognition of incidence and mortality resulting from cancer remains misconstrued and there is a great need for public education regarding prevention and early detection of malignancies (American Cancer Society, 1980).

The health care professional, already knowledgeable of the basic biological processes and symptomatology of cancer, should also be cognizant of the new developments in prevention and early detection of neoplasms (Cohen, 1978). This is no easy task considering the rapidly expanding body of knowledge in oncology medicine and nursing.

Intervention Pathways

Primary, secondary, and tertiary intervention pathways are the major approaches to the cancer problem utilized by health practitioners. Of the three approaches,

secondary intervention holds the most promise for decreasing the mortality of patients. It is the preferred method of intervention with testicular cancer and will be the focus of this discussion.

Primary intervention. Primary intervention, or cancer prevention, involves the study of the epidemiology and etiology of cancerous lesions. Carcinogens identified and verified through scientific research are then controlled and consumers are warned to eliminate them from their lifestyle. Primary intervention does a great deal to identify those individuals at a high risk who would benefit from special diets, lifestyles and medical care. Cancer prevention shows much promise, but, as Einhorn (1976) states, the lack of knowledge about the etiology of most neoplasms stands in the way of significantly altering mortality at this point in time.

The etiology of testicular cancer remains obscure, and with the exception of the treatment for cryptorchidism, primary intervention serves no useful purpose at present. The best hope for cure in testicular tumors is early detection and proper treatment.

Secondary intervention. Secondary intervention involves the early detection, or discovery of asymptomatic neoplastic pathology. This allows early treatment and, theoretically, better prognosis (Mushkin,

1974). Early detection is one of the most promising methods of cancer control as survival of the cancer patient depends on early diagnosis (Stromborg & Bourque-Nord, 1979). If cancer cannot be prevented with today's knowledge, which is true in the case of many neoplasms, it must be detected early for treatment to be optimal (Richards, 1978).

The major impetus for early detection of cancer lies with the patient. Only with awareness of symptomatology by the individual and immediate, proper medical attention can cancer be detected early and a cure obtained (Costanzi, 1978). The state of the art in cancer intervention lies in early detection.

The recognized procedure for early cancer diagnosis is screening. Screening is defined as the use of simple procedures on both asymtomatic and unrecognized symptomatic persons to delineate well persons who may have disease from those who do not (Richards & Holcombe, 1980). According to Miller (1976) there is a useful form of early detection or prevention for the twelve forms of cancer representing 80% of all cancers and 70% of all cancer mortality. The three types of screening discussed in this review are mass screening, self-care, and primary care screening.

Mass screening. Small numbers of mass screening programs have been successful, showing reduced mortality

among patient participants (Shapiro, Strox, Venet, & Venet, 1973). Overall, mass screening is plagued with criticism and financial problems (Richards & Holcombe, 1980) due to low yield, recruiting problems, poor physician utilization and inadequate end results evaluation (Miller, 1976). Mass screen for testicular tumors is not economically feasible due to the very low incidence of the disease.

Self-care. Self-care is a rapidly growing lay practice. Levin (1979) describes self-care as a "process whereby a lay person functions on his/her own behalf in health promotion and prevention, and in disease detection and treatment at the level of primary health resource in the health care system" (p. 11). Self-care aimed at cancer detection includes methods of monthly breast self-examination and awareness of the seven cancer warning signs. The patient's relationship with the health practitioner is important in facilitating self-care. The psychosocial, technical, and interpersonal perspectives of the health care provider all influence the outcomes of self-care (Chang, 1980).

Early detection of testicular cancer can be influenced by a man's knowledge of his testicles. Monthly self-examination of the testes is recommended by many health care professionals as a method of early detection

(Conklin, Klint, Morway, Sawyer & Shepard, 1978; Garnick, Mayer & Richie, 1980; Murray & Wilcox, 1978). Discovery of abnormalities combined with prompt action on the part of the patient may play a large part in recovery from testicular cancer.

Primary care screening. Cohen (1978) advocates a "properly constructed and applied cancer screening program by the primary care (practitioner) as a method of mortality reduction" (p. 770). He relates the unimpressive progress in the area of cancer prevention and early diagnosis not to lack of technical sophistication, but to its application. The American Cancer Society emphasizes the need to prevent morbidity, mortality and cost of cancer with recommendations for primary care screening (American Cancer Society, 1980).

Early cancer diagnosis is possible if the practitioner is knowledgeable and well organized. Cohen (1978) cites the advantages of primary health screening:

1. It can be made available to almost all people over a given time since they come in contact with a physician (or health care provider) either at home, in the office, or clinic, or their place of employment.

2. It can be cost effective since the patient will be receiving primary care as well as cancer screening.

3. The patient (practitioner) relationship allows a pursuit in depth of suspicious leads and

almost guarantees followup care.

4. The need for education as to value of screening can be concentrated on the (practitioner) who is usually anxious to learn and more easily indoctrinated. He, in turn, can educate colleagues; thus, communication of new ideas can be made quicker, easier, and cheaper (p. 771).

Primary care practitioner's involvement in the early detection of testicular cancer does not necessarily involve a rigid screening protocol as is the case for those cancers of the breast, colon and cervix. It involves knowledge and attitudes on the part of the practitioner which promote early detection. Those practitioners who do not examine patients with testicular complaints or exclude the possibility of a testicular tumor in their differential diagnosis do their patients a disservice. Support for the benefit of and involvement in patient teaching of monthly testicular self-examination is another primary care intervention supporting early diagnosis of testicular cancer.

Tertiary intervention. Tertiary care involves the management of patients with neoplastic disease. Primary care practitioners must have sufficient knowledge of those cancers they screen to provide their patients with proper diagnostic evaluation and referral. The patient is done a great inservice by an improper diagnostic procedure, course of treatment, or lengthy wait from diagnosis to referral.

All suspicious testicular masses should be referred to a specialist. Adequate knowledge and supportive attitudes on the part of the primary care practitioner eliminate useless tests and waste of valuable time needed by the patient for optimal recovery.

Deterrents to Early Detection of Cancer

Deterrents to effective early detection of cancer stem from the health care provider's knowledge and attitudes towards cancer and the cancer patient as well as the patient's response to the possibility of having cancer. This study examined the health practitioner's knowledge and attitudes on testicular cancer. It will evaluate whether the primary health care provider has a role in the lack of proper, early diagnosis of testicular neoplasms.

Patient role. "Delay in approaching health care providers results from people's reluctance to consider themselves sick or vulnerable to disease as well as from other, more concrete factors" (Greenwald, Becker & Nevitt, 1978, p. 213). Patients of lower classes are more likely to perceive themselves as ill and seek help (Koos, 1954). Suchman (1965) showed that obvious severe symptoms will bring patients to seek medical

care. Those patients who feel that treatment will be successful, which is not the case in a majority of cancer cases, are less likely to delay treatment (Battistella, 1971). Other factors involved in patient delay are psychological factors, stigmatization, social distance, feelings of humiliation, and concrete factors of time, money and effort (Mechanic, 1968). Poor communication with the health care provider can increase delay and noncompliance in patients as well (Korsch, Gozzi & Francis, 1968).

Americans fear cancer more than any other disease (Richards & Holcombe, 1980). Patients who fear suspicious indications as possible cancer approach the task of seeking help with trepidation, whereas indications of illness other than cancer would be a motivational factor in seeking help (Cobb, Clark, McGuire & Howe, 1954; Kunter & Gordon, 1961).

A study by Schwoon and Schmoll (1979) on motivational barriers to patient utilization of cancer screening programs among white and blue collar workers showed that behavior was influenced by a highly subjective probability of developing cancer. Patients did not present for examination due to perception of too long a waiting time, feeling healthy, fear of examination, denial of danger and no time.

Delay in the patient with testicular cancer. "The way in which a man responds to the discovery of a testicular mass may, in itself, substantially alter his prognosis" (Gorzynski & Holland, 1979 p. 125). Delay in patients seeking care for testicular masses is due more to attitudes, fears and emotions than lack of awareness of symptomatology (Holland, 1978), although, for most men anxiety is a force driving them to seek health care. Many men with testicular symptoms will "doctor shop" to avoid a biopsy and lengthen the critical time from proper diagnosis to treatment (Holland, 1978).

Health practitioner role. Although there has been great progress in the diagnosis and treatment of cancer in the last few years many health practitioners have "defeatist attitudes" (Clark, 1976 p.2) and poor knowledge about the necessary diagnostic tests and treatments for the disease.

"A crucial factor in the public perception of cancer is the physician's (health practitioner's) attitude toward the medical problem generically known as cancer..." (Blanchard, Ruchdeschel, Cohen, Shaw, McSharry & Horton, 1981 p. 2756). Their attitude has been described as one of "inevitability and biologic determinism toward cancer" (Blanchard et al., 1981, p. 2756) with defeatist attitudes about the usefulness of cancer therapy. Thus, health practitioner's attitudes have

been identified as barriers to effective care of the cancer patient.

Davies (1976) studied the effects of health practitioner's attitudes and behaviors on the care of cancer patients and found that effective communication was not being achieved between health practitioners and patients. This was shown to affect patient care adversely. When dealing with the cancer patient, the care giver becomes the "bearer of bad news" (Krant, 1976 p. 270) and may come to look at his/her self as the "condemner" (Krant, 1976 p. 270) of the patient. The feelings of anxiety in health providers faced with feelings of fatalism, pessimism and threats to their own impotence produced by the diagnosis of cancer in one of their patients may cause them to avoid the patient or, out of compensation for feelings of helplessness, run many unnecessary tests and procedures adversely affecting the patient.

Many recent studies have been carried out examining the negative attitudes of medical students toward cancer and cancer patients (Blanchard et al., 1981; Cooper, Bean, Alpert & Baum, 1980; Haley, Huynh, Paiva & Juan, 1977). Educators feel that the eventual change in health practitioner's attitudes towards the cancer patient will come through evaluating and impacting the development of student's attitudes. This will result in better, more comprehensive care and support for the cancer patient

and the promotion of early detection and benefits of therapy.

Many practicing health practitioners have limited knowledge of the current diagnostic and therapeutic modalities for cancer care. Their knowledge is often limited by a lack of personal experience with the cancer patient (DeWys, 1976).

A study carried out by the Australian Cancer Society (1976) on general practitioner's attitudes and practices related to the diagnosis and treatment of breast cancer showed a need to educate a number of those in the study on the importance or early biopsy for breast lumps and the improving prognosis of the tumor.

Inadequate knowledge base is a factor shown to have a negative impact on the nurse's role as health educator in the prevention and early detection of cancer (Elkind, 1980). Female nurses were asked by questionnaire to give opinions of the cervical pap test, breast self-examination and non-smoking as measures of cancer control. It was shown that the nurse's value of these control measures were based on the nurse's personal health behavior and perceived difficulty in undertaking the measure as well as lack of understanding of, and skills in, health education and inadequate knowledge base.

A study by Dent, Bassett and Goulston (1978) on

knowledge and attitudes of gastroenterologists in colorectal cancer showed a lack of awareness on recent developments in the treatment of this cancer. This was a group of specialists expected and trusted to have higher knowledge levels than general practitioners. Their lack of knowledge severely affects their ability to promote early detection of colorectal cancer in the population leading to delay of treatment and death in many patients.

Poor attitudes and lack of proper knowledge in health practitioners may lead to delay in diagnosis of the cancer patient. Practitioners need to have positive attitudinal postures and a solid knowledge base on cancers to avoid falling into the abyss of anxiety, defeatism, and ignorance which lead to poor practices and patient treatment outcomes in the cancer patient.

The Problem

Testicular cancer is primarily a tumor of young males in the prime of life (Markland, 1977). This neoplasm, in its most common forms, is curable (Javadpour, 1980; Katz, Grosback, Wein & Glick, 1978). Better treatment outcomes are achieved through early detection and treatment, as opposed to lengthy periods between diagnosis and treatment (Bosl, Goldman, Lange, Vogelzong, Fraley, Levitt & Kennedy, 1981). A study

by Post (1980) at West Virginia University Medical Center showed that almost 50% of patients seen for scrotal mass had been aware of it for greater than three months before seeing a doctor. The three year survival rate was 60% for this group compared to 81% for patients diagnosed within three months of discovery of a scrotal mass. In addition, the cost, psychological and physical stress to the patient and their family is significantly reduced by early diagnosis and treatment.

There are multiple citations in the medical literature on testicular cancer relating a lack of early, proper diagnosis to the health practitioner. The majority hypothesize that a lack of knowledge on the part of the care provider leads to lack of proper screening, early diagnosis and referral in patients with testicular tumors (Earlier diagnosis of testicular tumor, 1980; Markland, 1977; Patton, Hewitt & Mallis, 1959; Smith, 1978).

Smith (1978) referred to the health practitioner's delay in proper diagnosis and referral as the "great tragedy" of testicular cancer. He cited that the delay in diagnosis from initial recognition to the time of orchiectomy not uncommonly exceeds six months. Barzell and Whitmore (1979) pointed to the rarity of testicular tumor as the greatest obstacle to early diagnosis.

The most complete review of misdiagnosis of testicular tumors was completed by Patton et al. (1959). Over one third of the patients Patton studied had symptoms for six months up to two years before they were properly diagnosed. He attributed the lengthy period, in part, to the patient's own procrastination and, greater yet, to the lack of proper diagnosis on initial examination by the health practitioner. One fourth of the cases reviewed had been misdiagnosed initially. See Table 1.

A University of Minnesota population seen for further evaluation of testicular tumors showed 19 of 36 patients had had inadequate initial treatment of their primary tumor. The treatments consisted of local biopsy, needle aspiration, or local incision erroneously performed due to initial misdiagnosis and lack of appreciation for the grave nature of a testicular mass in a young population (Markland, 1977).

Bosl et al. (1981) describe a University of Minnesota review of 335 patients with the diagnosis of germ-cell testicular cancer relating disease stage at diagnosis to diagnostic speed. The group acknowledged patient and physician delay as factors affecting survival from testicular cancer. The median patient plus physician delay for Stage I patients was 75 days, Stage II was 101 days, and Stage III was 134 days. Specific

Table 1

Initial Diagnosis Made in 510 Patients with Testicular Tumors

Diagnosis	Percentage
Correct Diagnosis of Tumor	28%
Incorrect Diagnosis of Tumor	26%
Epididymitis	16%
Hydrocele	3%
Orchitis	2%
Miscellaneous	2%
"Nothing"	4%
No Diagnosis Stated	4%

Note. Reprinted with permission of the Journal of the American Medical Association. Patton, J.F., Hewitt, C.B., & Mallis, N. Initial diagnosis made in 510 patients with testicular tumors. Journal of the American Medical Association, 1959, 171 (16), 2196. Copyright 1959, American Medical Association.

physician delay median from initial physician visit to histological diagnosis of cancer was 10 days. In 39% of cases the time between presentation and diagnosis was more than 2 weeks. Patients who sought medical care within 2 weeks of onset of symptoms appeared to be the best candidates for early diagnosis and prompt treatment. Even in this group the physician caused a delay of at least 2 more weeks in greater than 50% of the population examined. Causes for physician delay are shown in Table 2.

The impact of delay in making the final diagnosis was substantial. The median delay in all patients between onset of symptoms and histological diagnosis was 85 days. Eighty-three and one-third percent of these patients had a cumulative delay of 117 days before proper diagnosis. There was a significant association between advanced (Stage III) testicular cancer and an initial delay by the patient and/or physician. This is important because of the drastically reduced survival in Stage III patients.

The authors recommend increased public education programs to educate young men about testicular cancer and its effects on their age group emphasizing the high cure rates in early tumors. They also recommend physician (health practitioner) education relating to the need to consider all testicular masses malignant until

Table 2

Causes for Physician Delay in Diagnosis of Testicular Cancer

Reason	No. Patients	% of recorded (n=321)	% of total (n=335)
No delay (<2 weeks)	204	63.6	60.9
Diagnosis delayed	117	36.4	35.0
No testicular examination	4	1.2	1.2
Incorrect diagnosis	86	26.8	25.7
No diagnosis	19	5.9	5.7
Other	8	2.5	2.4
Not recorded	14		4.1

Note. Reprinted with permission of The Lancet and N.J. Vogelzang, M.D. Table III. Causes for Physician Delay in Diagnosis of Testicular Cancer. Bosl, Goldman, Lange, Vogelzang, Fraley, Levitt & Kennedy. Impact of delay in diagnosis in clinical stage of testicular cancer, The Lancet, 2 (8253) October, 1981, 971.

proven otherwise. They emphasize that testicular pain is not a criterion for dismissing cancer in the differential diagnosis. More emphasis needs to be placed on complete physical examination with testicular palpation for local symptoms and examination for systemic symptoms. Close followup and orchiectomy for nonresolution of symptoms is encouraged by the authors.

Practitioners must exercise a "high index of suspicion" (Smith, 1978 p. 449) towards the possibility of the presence of a testicular tumor in a young man 15 to 35 years old (Fraley, Markland & Kedia, 1973; Markland, 1968; Smith 1978). The rarity of a testis tumor gives the health practitioner a false sense of confidence resulting in initial treatment of most testicular masses as inflammatory disease (Earlier diagnosis of testicular tumors, 1980).

Problem Statement

The purpose of this study was to address the question: What is the relationship between knowledge levels and attitudes of general health practitioners on testicular cancer and their clinical practices related to testicular masses?

Review of the Literature

Introduction

Testicular cancer has, for years, sparked a disproportionate interest among researchers in comparison to the clinical impact of the disease. This interest arises, in part, from the very diverse and puzzling histological patterns of the disease. Many researchers believe that solutions to important questions on neoplastic growth may be answered through examination of testicular tumor pathology. This search has created a voluminous reserve in the medical literature.

The literature review includes the basic principles involved in the anatomy, pathology, etiology, incidence, diagnosis, and treatment of testicular tumors. The material is presented to allow the reader a comprehensive understanding of the tumor and a base from which to evaluate the present problems of diagnostic delay in patients.

Anatomy of the Testis

During the sixth gestational month the inguinal canals are formed from small saclike pockets that herniate into the abdominal wall. The testis descends along this route into the scrotum accompanied by the lymphatics and its blood supply. The vas deferens

joins with the blood and lymphatics at the internal ring. These components make up the spermatic cord which suspends the testis in the scrotum (Zornow & Landes, 1981).

The scrotum is divided internally into halves and each half contains a testis, epididymis and part of the spermatic cord. A normal testis is 3.5 to 5.0 cm in length and 2.0 to 3.5 cm in width. The left testis is anatomically lower than the right due to a longer left spermatic cord. The testes are ovoid structures suspended vertically with flattened mediolateral surfaces. They are smooth, firm, regular, freely movable and slightly sensitive to compression. The epididymis lies posterior to the testis and is about 2 inches in length. It must be differentiated from the testis on examination (Malasanos, Barkauskas, Moss & Stoltenberg-Allen, 1981; Zornow & Landes, 1981). See Figure 1.

Pathology

Today testicular neoplasms remain a clinical challenge. The majority of these tumors are complex malignant growths of the germinal cells of the male testis. Ninety-three percent of intratesticular masses are malignant germ-cell tumors. The other seven percent are non-germinal cell tumors. Of these,

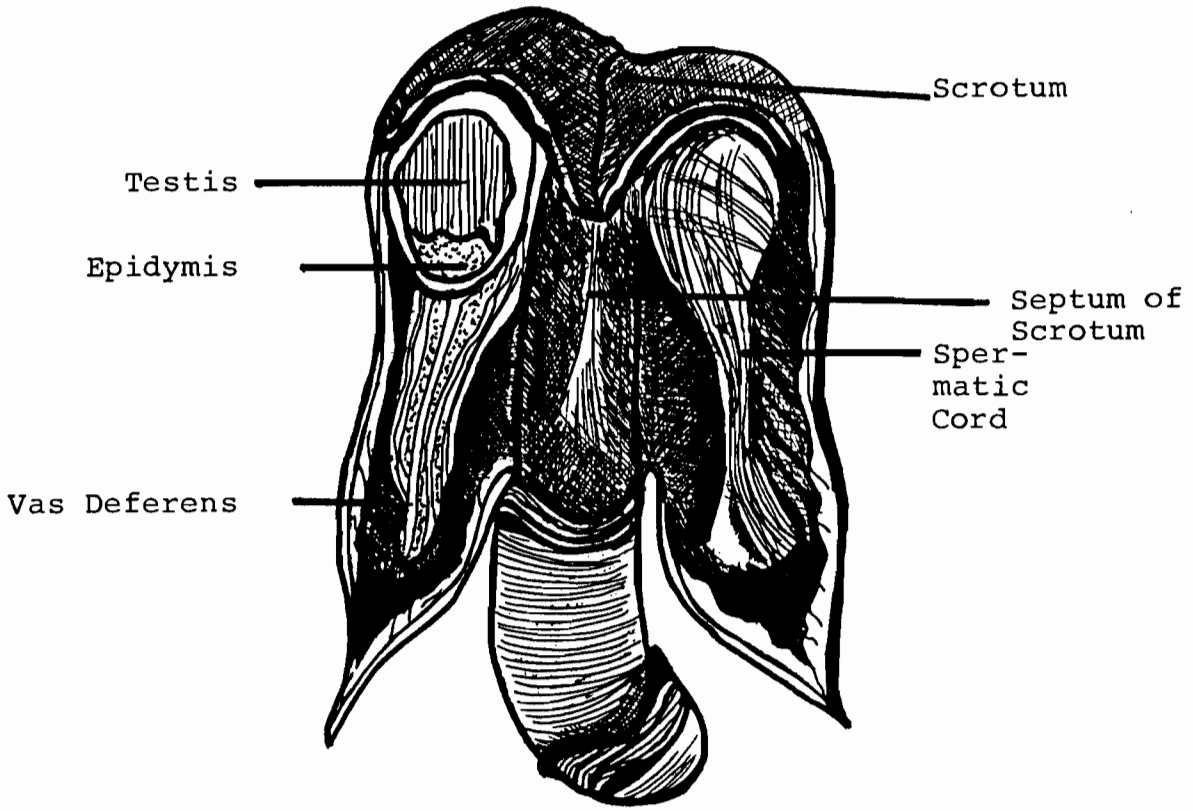

Figure 1. Diagram of testes

six percent are of gonadal stromal origin and one percent are tumors of the ductal system (Javadpour, 1980). Seminoma is the most common testicular tumor of germ-cell origin in adults, occurring in 40% to 50% of patients (Barzell & Whitmore, 1979; Smith, 1978). The peak incidence of seminoma is in 35 to 50 year old men (Merrin, 1977). Adult nonseminomatous germinal cell tumors consist of embryonal cell tumors, teratomas, choriocarcinomas and tumors of mixed elements. They occur in 20% to 25% of all cases (Barzell & Whitmore, 1979). These tumors are more virulent than the seminomas and metastasize swiftly. Non-germinal tumors consist of Leydig cell tumors and gonadal stromal tumors. They comprise the smallest percent of tumors and are benign in 90% of cases (Barzell & Whitmore, 1979).

The magnitude of confusion surrounding the research, diagnosis, and proper treatment of testicular neoplasms involves their pathological classification. There is a considerable complexity and variety of histological pattern to the disease leading to many unanswered questions about diagnosis, natural history, and therapeutic response (Anderson, Waldman, Javadpour & Glatstein, 1979). Various classification systems have been proposed in an attempt to clarify the diversity of the tumor and allow better recording of cases.

Friedman and Moore (1946), Dixon and Moore (1952), Collins and Pugh (1964), Mostofi and Price (1973), and Mostofi and Sabin (1977) for the World Health Organization have all published classification systems for organizing testicular neoplastic pathology.

The World Health Organization classification system developed and revised by Mostofi and Price (1973) and Mostofi and Sabin (1977) distinguishes testicular tumors as belonging to two separate groups. These categories of one cell type and mixed histology create a more precise destinction in terms of natural history and clinical behavior allowing greater precision of recorded cases (Katz et al., 1978). See Table 3.

Mostofi (1979) stresses the need for consistent management of testicular cancer. "It is essential that there be uniformity of criteria for diagnosis, and that there be standard clinical and pathological definitions, nomenclature, and classification of testicular tumors" (p. 29). The use of one classification system throughout the world would be a positive act toward clarifying future research and treatment efforts (Anderson et al., 1979; Kurohara, Webster, Badib, Boctor & Woodruff, 1969; Webber, 1979).

Incidence

Testicular neoplasms are the most common solid

Table 3

Histopathologic Classification of Testicular Tumors

Germinal cell origin
Seminoma
Spermatocytic
Anaplastic
Typical
Embryonal carcinoma
Adult type
Infantile type (yolk-sac tumor or endodermal sinus tumor)
Polyembryoma
Teratoma
Mature
Immature
With malignant transformation
Choriocarcinoma
Compound tumors
Embryonal carcinoma with teratoma (teratocarcinoma)
Any other combination of the above elements (14 possible combinations)
Nongerminal-cell origin
Insterstial cell tumor
Sertoli cell tumor
Gonadal-stromal tumor
Compound tumors (four possible combinations)

Note. Reprinted with permission of T. Anderson and Annals of Internal Medicine. Anderson, T., Waldman, M.D., Javapour, N. & Glatstein, E. Testicular germ-cell neoplasms: Recent advances in diagnosis and therapy: N.H. Conference. Annals of Internal Medicine, 1979, 9 (3), 373.

tumor in men 15 to 34 years old (Droller, 1980; Grabstald, 1975) and account for one to two percent of neoplasms in males (Clark, 1967; Javadpour & Bergman, 1978; Rubin, 1970). Testis tumors are the third leading cause of death in the 15 to 34 year old age group (Droller, 1980), and the most common cancer leading to death in the 29 to 35 year old age group (Anderson et al., 1979). These fatalities account for 12% of the total number of deaths attributable to solid cancers or 400-450 deaths per year (Droller, 1980).

Three peaks of incidence exist in the occurrence of testicular tumors. The first peak is in early infancy. Yolk sac tumors are most commonly seen in this population. The second and largest peak is in young adults in the 15 to 34 year old age group. Tumors of embryonal cell origin and teratocarcinomas are most often seen in this group. A third, smaller peak occurs in the elderly over 50 years old and produces mainly seminomatous tumors (Barzell & Whitmore, 1979; Droller, 1980; Schottenfeld, Warshauer, Sherlock, Zauber & Leder, 1980).

Overall incidence of the tumor in the United States is 2.1 to 2.2 per 100,000 males comprising one to two percent of all male malignant disease (Clark, 1967). Although testicular cancer is a rare occurrence and does not impact survival statistics, it is a

therapeutic problem due to the youth of the age group it most commonly affects (Anderson et al., 1979).

England has a rate of 2.5 per 100,000 males (Grabstald, 1975; Javadpour, 1980). The incidence in the black population is one sixth to one tenth of that in white males (Shottenfeld et al., 1980; Sherman, Ciavarra & Cohen, 1973). Testicular tumors are rare in African, Asian, New Zealander and Japanese populations (Grabstald, 1975; Higginson & Oettle, 1960).

Age adjusted incidence in white males has nearly doubled since 1935 (Shottenfeld et al., 1980). New clinical evidence points toward an increasing incidence in the United States and abroad (Grabstald, 1975; Silverberg & Holleb, 1972; Smith, 1981). The National Cancer Institute projects 3.7 cases per 100,000 men in the year 1981 (Parchini, 1980).

Etiology

The etiology of testicular cancer remains obscure. Researchers have explored the relationship of the tumor to age, genetic factors, trauma, repeated infection, endocrine abnormality and cryptorchidism. Knowledge of those patients who may have a greater risk of developing testicular cancer is of preventive and diagnostic value to the health practitioner.

The most significant risk factor for developing

testicular cancer is cryptorchidism (Gilbert & Hamilton, 1940; Henderson, Benton, Jing, Yu & Pike, 1979; Morrison, 1976; Mostofi, 1979). There is increasing evidence to show that cryptorchidism is the manifestation of a primary congenital defect. The dysgenetic character of the testes resulting from the defect leads to malignancy (Barzell & Whitmore, 1979). The probability of developing a malignancy of the testis is increased 20 to 40 fold in an unrepaired, undescended testis (Dow & Mostofi, 1967; McKay & Sellers, 1966). There is also a 20% incidence of malignancy occurring in the contralateral normally descended testis (Smith, 1978).

Barzell and Whitmore (1979) state that the surgical procedure of orchipexy does not prevent the development of a malignancy in an undescended testis. Although this is relevant for those surgeries done after age six, data on those procedures performed in patients prior to this age is scant. The surgery performed on patients under age six has not been practiced long enough to evidence results as the latent period for most testicular tumor transformation is twenty years (Barzell & Whitmore, 1979).

Testicular cancer is most common in white males in the middle and upper social classes. Men with a history of malignancy in one testis have risk of developing

another tumor in the contralateral testis that is 500 times greater than that of the general population (Morris, Vaughn & Constable, 1976). Young professional men have a four fold incidence compared to unskilled laborers and bus drivers (Graham & Gibson, 1972; Parachini, 1980). Those men born to mothers taking exogenous hormones such as diethylstilbestrol or with high endogenous hormonal (progesterone/estrogen) levels during pregnancy causing symptoms of unretractable nausea may be at increased risk for developing testicular tumors (Henderson et al., 1979; Schottenfeld et al., 1980). Gonadal dysgenesis and certain types of infertility are also risk factors for development of testicular malignancy (Early testicular cancer, 1980; Barzell & Whitmore, 1979).

Diagnosis

"The greatest hope in reducing mortality (from testicular cancer) lies in early diagnosis... The testis is an external organ and, except in cryptorchidism, is readily accessible for minute examination. Why is there a delay in diagnosis?" (Patton, Hewitt & Mallis, 1959 p. 2196).

The early diagnosis of testicular neoplasms is crucial for optimal treatment outcomes (Bosl et al., 1981; Patton et al., 1959). Early diagnosis, however,

is not the predominant occurrence. A substantial number of testicular tumors are not diagnosed early enough for optimal treatment response (Barzell & Whitmore, 1979; Bosl et al., 1981; Markland, 1977; Patton, 1959; Smith, 1978).

The patient plays a large role in this delay (Patton et al., 1959; Post & Belis, 1980; Smith, 1978). Anxiety and fear of cancer and loss of virility as well as misconstrued positive thoughts as to the masculinity of larger testicles lead to dismissal of symptoms (Gorzynski & Holland, 1979).

Of greater significance is the health practitioner's delay in diagnosis and referral of testicular tumors (Smith, 1978). The health practitioner with low knowledge level, poorly developed examination skills, or adverse attitudes on testicular cancer may avoid proper differential diagnosis, perform improper procedures for diagnosis, avoid examination of the patient or balk at referral when it is necessary.

Practitioners must exercise a "high index of suspicion" towards the possibility of a testicular malignancy in a young man 15 to 35 years old (Fraley, Markland & Kedia, 1973; Markland, 1968; Smith, 1978). The rarity of a testis tumor gives the health practitioner a false sense of confidence resulting in initial treatment of most testicular masses as inflammatory

disease (Earlier diagnosis of testicular tumor, 1980). Twenty percent of cases of testicular tumor are misdiagnosed as epidymyorchitis. Hydrocele is the second most common misdiagnosis (Smith, 1978). Barzell and Whitmore (1979) state that the rarity of testicular cancer is the greatest obstacle to early diagnosis.

A careful bimanual testicular examination should be a routine part of any physical examination (Markland, 1977; Patton et al., 1959; Post & Belis, 1980; Wasserman, 1976). The examination should be performed with the patient standing in front of the examiner and should include transillumination, weighing of the testis in one's hand, feeling for density of tumor, and carefully identifying parts of the scrotal contents (Markland, 1968). Any suspicious mass should be considered malignant until proven otherwise (Anderson et al., 1979; Borski, 1973; Javadpour, 1980; Markland, 1968). If the diagnosis remains doubtful after careful examination the patient should be referred for exploratory surgery (Patton, 1959).

Health practitioners should never perform aspirational or transscrotal biopsies when testicular neoplasm is suspected (Patton et al., 1959; Post, 1980). These procedures lead to widened metastatic spread through inguinal nodal metastasis.

Health practitioners may do certain tests if

testicular malignancy is suspect. The best diagnostic procedure remains the physical examination of the patient with emphasis on local as well as systemic symptomatology (Smith, 1981). Chest x-ray is indicated for all suspected malignancies. Ultrasound is a safe, reliable diagnostic test, but should always be preceded by a careful physical examination of the patient (Sample, Gottesman, Skinner & Ehrlich, 1976; Early testicular cancer, 1980). Serum samples for measurement of human chorionic gonadotrophin and alphafetoprotein levels should be drawn prior to surgery, and are of diagnostic and prognostic value to patients with nonseminomatous tumors as these circulating tumor markers are present in 85% to 90% of patients (Anderson et al., 1979; Javadpour, 1979).

Health practitioners have a responsibility to teach all male patients over the age of fifteen about testicular cancer and its symptomatology and encourage followup for abnormalities. Monthly self-examination should be taught and encouraged and is most reliable if performed while standing in a warm shower (Brody, 1981; Conklin et al., 1978; Garnick et al., Gault, 1981; Parachini, 1980; Earlier diagnosis of testicular tumor, 1980; Early testicular cancer, 1980).

It is difficult to delineate one specific presentation related to the presence of a testicular tumor as

there are a wide range of signs and symptoms involved in this disease. Gordon-Taylor (1947) described testicular presentations from "obvious to bizarre" (p. 6).

The symptoms which the patient with a testicular tumor experiences can be related to direct tumor growth, metastatic tumor growth, or to constitutional effects (Katz et al., 1978). Common symptoms include a mass or swelling of the testicle, heaviness in the scrotum, pain and/or swelling in the groin, abdominal pain, and low back pain (Borski, 1973; Markland, 1968; Smith, 1978). Gynecomastia is seen in 1% to 4% of patients (McKay & Sellers, 1966). Acute/subacute epididymitis was present in 16% of patients in a study by Patton (1959). Pain of the testicle is a major complaint in some patients. Patton (1959) showed pain to be almost as common a complaint as the absence of pain. Tumor should not be excluded on the basis of the patient's reports of pain.

Treatment

Swellings of the scrotum figure conspicuously among the earliest illustrations of pathological conditions in man (Landes & Leonhardt, 1967). During the Roman Ages, Celsus described the difference between fluctuant tumors and solid tumors of the testis.

Fluctuant types were either cirsocele, hydrocele, or bubonocele. The solid tumors were classified as sarcocele (Blandy, Hope-Stone & Dyan, 1970). This nomenclature remained throughout the Renaissance Period.

The treatment for scrotal swelling, after testing for syphilis, was orchidectomy. Castration was an appalling undertaking as early surgeons had no anesthesia.

In 1651, Harvey developed the theory of arterial ligature and applied it to the treatment of testicular tumors. The method was ligation of the testicular artery on the affected side. The operation was looked upon as a method for avoiding the horrendously bloody orchidectomy, but did not prove valuable. Orchidectomy remained the treatment of choice until the seventeen hundreds (Blandy et al., 1970).

Pott was one of the first surgeons to urge early castration for testicular tumors. He promoted swift surgical procedures and protected patients from hematoma and sepsis, complications which were previously ignored by early eighteenth century surgeons (Blandy et al., 1970). Curling and Hutchinson, his successors, continued research on testicular growths throughout the nineteenth century. The 1900s initiated the radical orchidectomy where the testis and the regional lymph nodes it drained were removed (Blandy, 1970).

Cure rates remained low for both simple and radical

orchidectomy until the 1950s. The five year survival rates ranged from as low as five percent to only 25% in patients without metastasis (Blandy et al., 1970). Radiotherapy was the first treatment to significantly alter survival rates in patients with testicular cancer. Seminomatous tumors were found to be extremely radiosensitive and could be erradicated by radiation alone in many cases (Blandy et al., 1970).

Today, in the late twentieth century, testicular cancer is curable even in advanced cases (Javadpour, 1980; Katz et al., 1978). Improved diagnostic and management regimens have played a large role in these cures. This does not by any means decrease the value of early diagnosis and referral.

The diagnosis of testicular cancer is established by high inguinal orchiectomy. Histological classification and staging of the tumor determines the mode of treatment (Anderson et al., 1970; Einhorn, 1980; Whitmore, 1979).

Diagnostic staging workup of testicular tumors includes:

1. History and physical examination
2. CBC and SMA
3. Beta human chorionic gonadotropin determination by radioimmunoassay
4. Alphafetoprotein determination by radio-

immunoassay

5. Chest x-ray and whole lung tomograms

6. Abdominal CAT scan (Drasga, Williams & Einhorn, 1982). The basic staging system used throughout the United States consists of three tumor levels (Staubitz, 1973)

Stage I - tumor confined to the testis

Stage II - metastatic disease in retroperitoneal lymph nodes

Stage III - metastatic lesions beyond the retroperitoneum (p. 1207).

Several modifications of the original system for staging have been advocated to allow more precise evaluation of tumor dissemination. There is disagreement about the uniform adoption of a single category of staging, as in the histopathological classification dispute. Differences exist between basic British and American systems as well as those more complex systems stemming from the basic staging classifications. There is presently no uniformly adopted staging system in the United States and each separate institution utilizes different methods (Mostofi, 1979).

The definitive diagnosis (of testicular cancer) by orchidectomy initiates a number of therapeutic treatment modalities, depending on the type of tumor and stage of tumor. Surgery, radiation therapy, and

chemotherapy are the three main treatment modalities. The most adequate treatment for testicular cancer is, as yet, undefined. Mair and Lee (1977) attest this to:

> 1. the rarity of the disease, preventing the accumulation of sufficient numbers of patients to evaluate treatment;
> 2. different classifications of histologic types of tumors and different staging systems, making comparisons from different treatment centers difficult;
> 3. inadequate staging of individual patients;
> 4. the large number of different treatment programs, and
> 5. the lack of controlled studies comparing treatment methods (p. 477).

The major modes of treatment of testicular neoplasms can be distinguished by two primary tumor classifications, seminomatous and nonseminomatous.

Seminomatous Tumor

Radiotherapy is the treatment of choice for low stage seminoma, as the tumor is extremely radiosensitive. Five year survival rates approaching 100% can be achieved in Stage I and small volume Stage II disease by radiotherapy combined with inguinal orchiectomy (Anderson et al., 1979; Dosoretz, Shipley, Blitzer, Gilbert, Prat, Parkhurst & Wang, 1981; Einhorn, 1980). Irradiation is aimed at the retroperitoneal and ipsilateral pelvic nodes as seminoma has a proclivity for lymphatic metastasis. Megavoltage external beam irradiation of 2,500 to 3,500 rads is, in most cases tumorcidal (Anderson et al., 1979; Shipley, 1980).

Treatment for large volume Stage III tumors is controversial. The most widely accepted treatment includes orchiectomy followed by chemotherapy to reduce tumor bulk with followup surgical resection or irradiation of residual disease (Smith, 1982).

Chemotherapy

The rapid evolution of chemotherapy in the last ten years has enabled complete response rates of 70% in patients with metastatic non-seminomatous germ-cell tumors (Drasga, Williams & Einhorn, 1982; Smith, 1982). Chemotherapy for testicular neoplasm represents one of the most successful chemotherapies against solid tumors in humans (Li, Whitmore, Golbey & Grabstald, 1960). These treatment regimens are in constant flux (Anderson et al., 1979). The two main protocols are based on the use of cis-platinum (cis-dichlorodiammineplatinum II, DDP). They are PVB (Cis-platin, vinblastin, bleomycin) and VAB IV (Cis-platin, vinblastin, actinomycin D, bleomycin, and cytoxin) (Smith, 1982).

Non-Seminomatous Tumor

Stage I non-seminomatous tumors are treated with orchiectomy followed by retroperitoneal lymph node dissection and observation for reoccurrence. Positive nodes on retroperitoneal lymph node dissection or positive CAT scan, lymphangiogram, or chest x-ray indicates

Stage II disease to which chemotherapy is added. Bulky Stage II disease is treated with chemotherapy prior to retroperitoneal lymph node dissection to reduce tumor bulk. Stage III disease treatment is similar to that of Stage II (Smith, 1982). Patients who fail to obtain a complete remission after induction chemotherapy should be evaluated for further surgery. One third of patients have residual mature teratoma, one third have fibrous tissue formation and one third have persistent carcinoma (Drasga et al., 1982) (See Figure 2).

Conceptual Framework

This study is based on the conceptual model depicted in Figure 3. The model identifies health practitioner knowledge, skills and attitudes as those factors which impact the level of health practitioner competency. Competency, in turn, affects the health practitioner's performance and finally, the quality of care and patient treatment outcomes.

Ultimately the health care provider's clinical performance is dependent on knowledge, skills, and abilities which are dependent on a variety of educational and learning experiences (Chase & Burg, 1977). The Kaiser Permanente Health Care System's policy for quality assurance and physician education states that

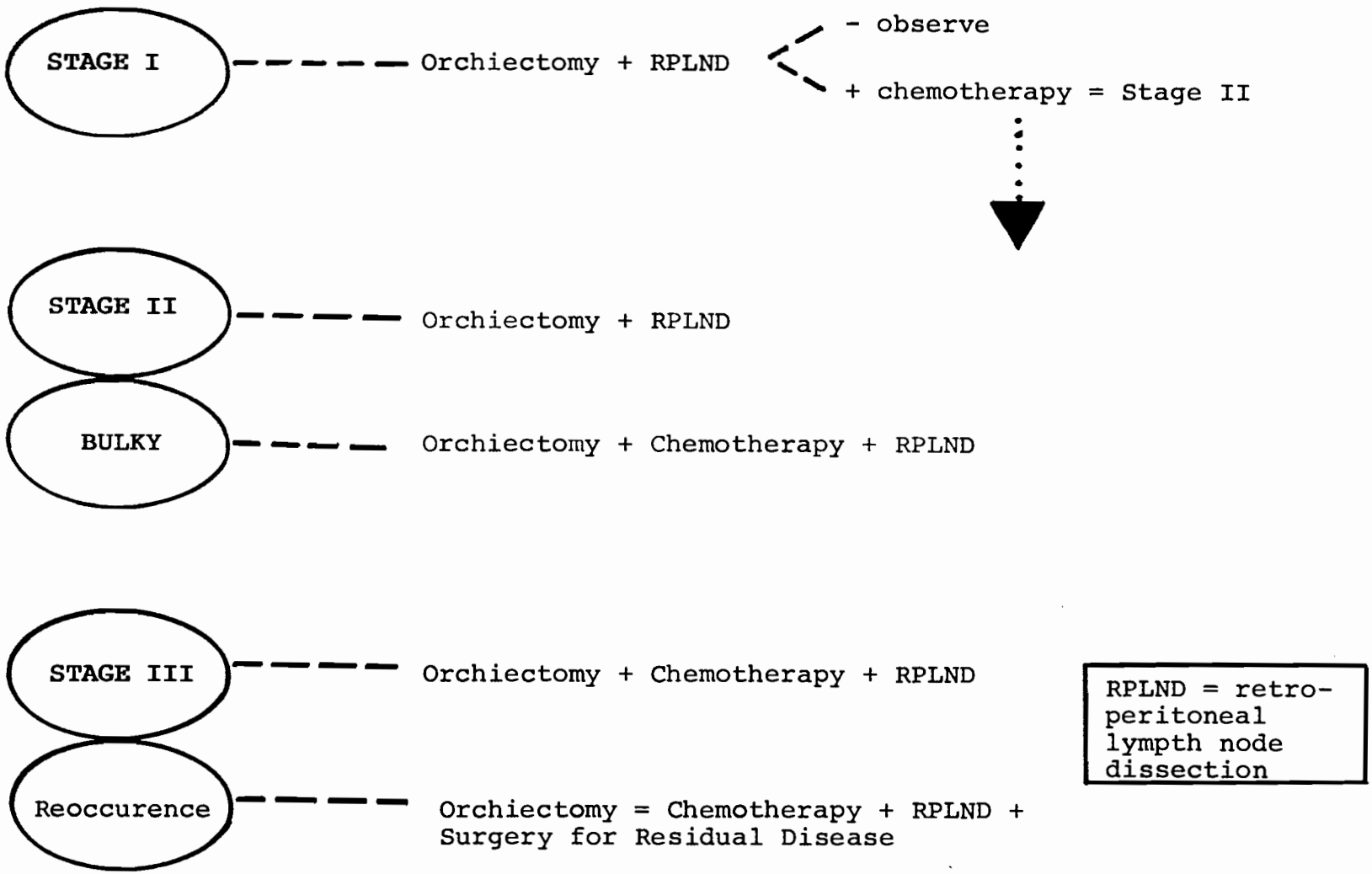

Figure 2. Treatment for non-seminomatous tumors

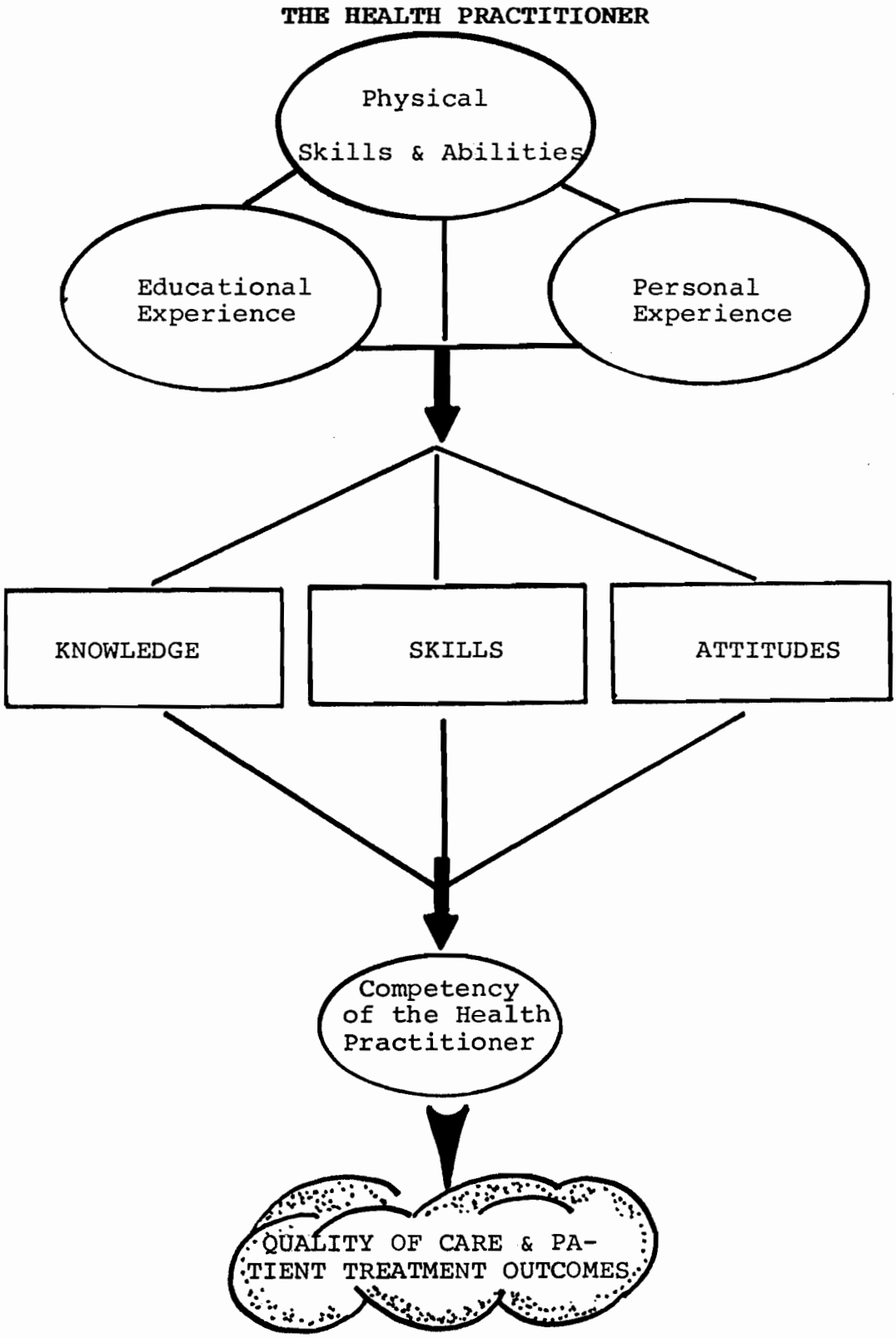

Figure 3. Model for health practitioner treatment outcomes

the "quality" of care is related to health practitioner education (Rubin, 1977 p. 29).

Knowledge, skills, and attitudes determine competence. Health practitioner competence is defined as "the capacity to act." It refers to what the health practitioner can do and is based on test performance (Lloyd & Abrahamson, 1979,p. 253). The components of health practitioner competence encompass the need for current scientific or cognitive knowledge, current practice skills in the technical, problem solving, and communication areas and attributes of caring and concern for the patient (Continuing Medical Education and Continuing Professional Competence, 1977). Burg (1976) identifies factual knowledge, technical skills, clinical judgment, attitudes and interpersonal skills as those abilities that competency is based upon. The American Nurses Association philosophy on continuing education defines knowledge, skill, and attitudes as those factors initial in improving the quality of health care the public receives (Continuing education in nursing: An overview, 1979).

Competence is an important variable in the quality of patient care (Gonnella, 1979). It impacts health practitioner performance and patient treatment outcomes (Lloyd & Abrahamson, 1979). There is some speculation as to whether competence is enough to ensure quality

performance by a practitioner and data is sparce on the relationship between competence and performance (Bird & Schoolman, 1977). Traditionally, continuing education is oriented toward a goal of exposure of the health care practitioner to information leading to heightened knowledge level and change in behavioral characteristics favorably altering patient care outcomes (Scott, 1976). It is this principle on which the model for this study is based.

The measurement of knowledge and attitudes of the health care practitioner is important as these factors ultimately determine the quality of patient care. Gonnella (1979) underlined the necessity for evaluation of the health care professional. He outlined four categories of health practitioners:

> 1. Those who know what to do, are capable of doing it and are performing.
> 2. Those who know what to do and are capable of doing it, but are not doing the work.
> 3. Those who know what to do, but are not capable of doing it, and therefore, cannot translate their knowledge into performance; and
> 4. Those who lack knowledge and most likely cannot perform (p. 826).

Evaluation by this process of reviewing knowledge, attitudes and skills enables the development of educational programs for practitioners which lead to better care and healthier patients. Those practitioners with low knowledge levels (4) are the most "curable"

whereas attitudes are much more difficult to ascertain accurately and alter.

Knowledge

Knowledge is critical to practice in the health care professions as it is to other fields. The knowledge base in the health care sciences is extremely dynamic, growing and changing daily. Health practitioners are required to use knowledge of recent origin as well as historical data in the diagnosis and treatment of patients. Brown and Lee (1980) relate the rapid growth of knowledge and technology in the health care field to the expanding need for continuing education in the practice of nursing.

Ostler (1969) stated that "knowledge which a man can use is the only real knowledge; the only knowledge which has life and growth in it and converts itself into practical power" (p. 96). Scott (1976) referred to the acquisition of knowledge as a means for the health practitioner to gain "power" (p. 444). Gonnella (1979) noted the presence of medical knowledge as a factor in determining practitioner performance. Knowledge has been shown to be a factor in determining practitioner competence and performance, although it is not singularly involved in altering health professional behavior (Ashborough & McKean, 1976). Knowledge

gives opportunity, as one cannot use knowledge he does not possess.

Attitudes

Attitudes are much more difficult to define and measure than knowledge levels. They, however, are believed to have a significant impact on the competence, performance and outcomes of care instituted by the health practitioner. The display of proper attitudes is as important a component in the performance of the care giver as is knowledge (Gonnella, 1979). A competent health care professional "attitudes of caring and concern and respect for the dignity, the rights, and the personal values of the human being who is the patient" (Continuing Medical Education and Continuing Professional Competence, 1977, p. 220).

Attitudes can be defined as the "evaluative or affective component of the individual's perception of a concept or relationship between concepts" (Fishbein & Ajzen, 1972 p. 487). Thurstone (1928) defined attitudes as "the sum total of a man's inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any specific topic" (p. 531).

Many researchers conceptualize attitudes as consisting of three components. The first, or cognitive

component, represents the person's information about an object; the affective component reflects a like or dislike for an object; the final connotative component reflects the person's tendency to act toward their attitudes consistently (Sims, 1981).

In recent years there has been considerable debate as to whether attitudes directly predict behaviors. Wicker (1969) concluded that "it is considerably more likely that attitudes will be unrelated or only slightly related to overt behavior than that attitudes will be closely related to actions" (p. 41). Fishbein (1973) disagrees, hypothesizing that attitudes predict behavior provided that an appropriate attitudinal variable is measured and the behavioral criterion is reliable and stable. Kahle and Berman (1979) support the hypothesis of a causal relationship between attitudes and behavior. Their study used a crosslagged panel correlation to evaluate college student's ratings of four issues. The results showed a casual predominance of attitudes over behaviors.

Summary

Both knowledge and attitudes are important variables in the performance, competence, and quality of care the health care giver provides. They, therefore, impact the patient treatment outcomes and ultimately the

health of the patient. These variables are measurable and can give the researcher insight into the data base of the practitioner. Evaluation of the health practitioner is, as Gonnella (1979) stated, important considering the dynamic nature of the health sciences. Evaluation preceding constructive methods for alteration of necessary gaps in the practitioner's data base is an important step in improving the health care all patients receive.

Conceptual Definitions of Variables

Knowledge Levels

Knowledge levels were defined as the degree of familiarity, awareness or understanding gained through experience or study (American Heritage Dictionary, 1971 p. 393) (Davies, 1971).

Attitudes

Attitudes were defined as "The sum total of a man's inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any specified topic" (Thurstone, 1928 p. 531).

General Health Practitioner

General health practitioners were defined as those health care professionals at the level of licensed nurse

practitioner, medical doctor, or physician assistant trained and involved in the care of clients in a general medical practice.

Testicular Cancer

Testicular Cancer was defined as any neoplasm of the testis in human males.

Practices

Practices were defined as the use by a physician, nurse practitioner, or physician assistant of his/her knowledge, skills, and attitudinal postures in diagnosis, treatment, and prevention of disease and its ramifications. The actions of a practitioner in the treatment of disease (Taber's Cyclopedic Medical Dictionary, 1974 p. 128) (Thomas, 1970).

Research Questions

The research questions explored in this study were:

1. How do knowledge levels (scores) correlate to practices in evaluation of clinical cases of testicular masses?
2. Are there differences in knowledge levels (scores) on testicular cancer among the practitioners studied (M.D., N.P., and P.A.)?
3. Are clinical practices related to testicular masses proper or improper?

4. What are the reasons why practitioners defer testicular examination?

5. How do knowledge levels (scores) relate to attitudes about specific issues relating to diagnosis and treatment of cancer and specifically testicular cancer?

6. To whom do practitioners refer patients with suspicious testicular masses?

7. What percent of practitioners value the use and teaching of testicular self-examination to patients?

Assumptions and Limitations

Assumptions

The assumptions employed in the project were:

1. Testicular cancer is curable in its early stages.

2. Health practitioners encounter the early signs and symptoms of testicular cancer.

3. Rates of testicular cancer are rising around the world. The time interval between initial symptoms and proper diagnosis and treatment of testicular tumors is too lengthy in the majority of cases.

4. Health practitioners should be able to diagnose most testicular tumors by examination alone.

5. Health practitioner knowledge and attitudes are two of three measurable factors determining

competency and patient treatment outcomes.

6. Health practitioners participating in the study will answer questionnaires honestly without consulting outside references.

Limitations

1. Mailed questionnaires may result in sample bias due to low yield limiting generalizability, ability to generalize to a larger population.

2. Answers to the questionnaire may contain the health practitioner's view of "ideal" behavior rather than their true behavior.

3. The design does not control for all potential independent variables as factors other than knowledge affect clinical practice.

4. Poor practices may stem from factors other than knowledge level or attitudes.

5. Those practitioners consenting to participate in the study may be those who are more knowledgeable and eager to show their abilities.

Rationale / Significance of the Study

The literature cites an apparent lack of proper screening, early diagnosis and referral of testicular tumors by primary care practitioners due to an assumed lack of knowledge on the subject. These practices pre-

vail despite the simplicity of the screening examination and ease of diagnosis of the tumor in most patients.

The lack of proper orientation on testicular cancer among general health care providers is attributed, in part, to the rarity of the tumor. However, the "hallmark of a truly competent practitioner is having knowledge to be aware of, recognize and know what to do about problems that are not frequently seen or are even rare" (Continuing Medical Education and Continuing Professional Competence, 1977,p. 221).

Practitioner's poor practices may stem from an absent "index of suspicion" (Smith, 1978,p. 449) and a lack of correct knowledge about the disease as well as adverse attitudes and lack of technical skills. It is important to evaluate the levels of knowledge and attitudes and related practices among practitioners relative to testicular masses. Although there is an assumed lack of knowledge and some data on improper practices among practitioners, there have been no studies to evaluate the validity of the supposed lack of knowledge and no studies examining attitudes. There is a need to study these variables and institute supplemental educational programs of choice in the case of a demonstrated need.

CHAPTER II

DESIGN OF THE STUDY

Design

This study was a nonexperimental, descriptive correlational survey. It describes the relationships of levels of knowledge and attitudes of health practitioners to their clinical practices in the management of testicular masses.

Setting of the Study

The study was carried out in Salt Lake City, Utah between January 1982 and June 1982. Questionnaires were mailed through the local post office in January 1982. Followup questionnaires were mailed to those not responding after a three to four week period. Participants received the questionnaires at the addresses listed with the Utah State Medical Society, the Utah State Nurses Association and the Utah Academy of Physician Assistants.

Population

The study population consisted of licensed family practice physicians, nurse practitioners, and physician

assistants currently practicing in Salt Lake City, Utah and belonging to the local professional organization representing their profession. These organizations were: the Utah State Medical Association, the Utah Nurses Association, and the Utah Academy of Physician Assistants.

Family Practice Physicians

Physicians had a basic training of four years of medical training post baccalaureate degree ensuring them the degree of medical doctor (M.D.). Internship training certified them to practice medicine. The physicians in the study were all specialists in the area of family practice through additional residency training and/or certification.

Nurse Practitioners

Nurse practitioners traditionally evolve from three different educational levels. Despite this difference in educational background these nurse practitioners are assumed to function quite similarily. All nurse practitioners are licensed as registered nurses. At this point they begin to differ. The three levels of education of the nurse practitioner were: certification through continuing education programs, baccalaureate degree training, and graduate level training at either the Masters degree or Ph.D. level

(Mentink, Trolinger & O'Hara-Devereaux, 1980). Certification examination for nurse practitioners is offered by the American Nurses Association.

Physician Assistants

Physician assistants are individuals who have successfully completed a program for the assistant to the primary care physician approved by the Council on Scientific Education in the State of Utah. These health practitioners are not required to have any previous degree prior to training, yet many now enter programs with experience in the health care fields and/or college degrees. Training programs are intensive and range from twelve months to two years. There is a National Certifying Examination which physician assistants take on completion of their training.

Sample

The sample was chosen from lists of currently practicing, licensed family practice medical doctors, nurse practitioners, and physician assistants supplied by the professional associations to which they were members. All of those professionals listed with their organization as practicing in Salt Lake City were mailed questionnaires to the addresses listed. These organizations were: The Utah State Medical Association (for physicians), The Utah Nurses Association (for Nurse

Practitioners), and the Utah Academy of Physician Assistants (for Physician Assistants).

Questionnaires were mailed to 44 medical (family practice) physicians, 34 nurse practitioners, and 27 physician assistants. Those responding with complete questionnaires and signed consent forms comprised the study sample.

Operational Definitions of Variables

Knowledge Levels

Knowledge levels were considered to be high, moderate, or low determined by the subjects answers to the questionnaire. Of ten possible correct; 85% to 50% indicated moderate knowledge level, and 50% and below reflected low knowledge level.

Attitudes

Attitudes were measured by answers on the questionnaire one through five. One = strongly disagree; two = disagree; three = undecided; four = agree; five = strongly agree. Total scores ranged from 8 to 40, with 32 to 40 as positive attitudes and below 32, a negative attitude indicator.

Practices

Practices were determined proper or improper

as determined by answers to four clinical case studies of testicular abnormalities in the questionnaire. Proper = all four cases answered correctly; Improper = less than four cases answered correctly. Range is from one (no answers correct) to four (all answers correct).

Data Collection Methods

Data collection was carried out through the use of a questionnaire developed by the author. The survey consisted of three parts: Part I - demographic data questions; Part II - knowledge and attitude questions totaling twenty-four; Part III - clinical practices case studies totaling four. Solutions to the knowledge, attitude, and clinical practice questions consisted of multiple choice, true/false, and scale rating answers. The questionnaire was four pages in length and should have taken approximately 20 to 30 minutes to complete. It was accompanied by the face sheet, informed consent form and a letter from the education director of the Utah Chapter of the American Cancer Society encouraging participation in the study. Subjects were asked not to consult outside references for answers to questions.

The tool was developed in part from questions in a survey performed by the Australian Cancer Society on breast cancer that was supplied by David Hill, the Education Director of the Anti-Cancer Council of Victoria,

Australia. The remainder of the questionnaire was developed through the review of the literature on testicular cancer. The author developed ten basic knowledge questions from the review areas of incidence, etiology, diagnosis and treatment of testicular cancer. Attitudinal questions were drawn from the Australian Cancer Society survey and supplied by the author on the subjects of testicular self examination and the prognosis of testicular cancer. The clinical case studies were written by Dr. Joseph Smith, a urological oncologist.

CHAPTER III

ANALYSIS AND DISCUSSION OF DATA

Introduction

The study sample was composed of a total of thirty-nine respondents. This group was subdivided into three groups of ten family physicians, twenty-one nurse practitioners, and eight physician assistants. There were twenty male participants and nineteen female participants. Demographic information is shown on Table 4.

Data were collected by means of a short questionnaire and answers were based upon grouped and individual frequency distributions and correlational analysis by use of Kendall's Tau statistic. Analysis of the data will be shown with each individual research question followed by a discussion of the findings.

Research Questions

Research Question One

Research question one stated "How do knowledge

Table 4

Demographic Characteristics of the Study Sample

Sample	%	N	Range	Mean
Males				
M.D.	100.0%	10		
N.P.	14.3%	3		
P.A.	87.5%	7		
Females				
M.D.	0%	0		
N.P.	85.7%	18		
P.A.	12.5%	1		
Year Graduated				
M.D.		10	1941-78	1962
N.P.		20	1962-82	1978
P.A.		7	1975-82	1978
Age				
M.D.		10	32-69	48.0
N.P.		20	25-50	32.7
P.A.		8	26-61	36.3
Years in Practice				
M.D.		10	4-38	17.6
N.P.		21	1-24	5.6
P.A.		7	1-7	4.0

levels (scores) correlate to practices in evaluation of clinical cases of testicular masses?"

Average total group (N=29) clinical practices scores from 0-4,based on answers to four clinical case studies,were related to total group (N=39) knowledge scores ranging from 0-10 points on ten basic questions about incidence, epidemiology, diagnosis, and treatment of testicular tumors. Due to an N of one for scores of two points and nine points those subjects scoring 2-3 points and 8-0 points were grouped together to avoid samples of one in these groups.

There was a statistically significant and positive association between total clinical practices scores and total knowledge scores (Kendall's Tau = .21; $p < .05$). A correlation coefficient of .21 is low; however, it is statistically significant and explains 4% of the variance. Kendall's tau was used in analyzing this research question because it is a measure of strength and direction of a relationship (clinical practices scores with knowledge level scores) for ordinal level data.

It is graphically apparent that the most significant trend in the relationship of clinical practices scores to knowledge scores in this study sample is among those subjects with higher knowledge levels. Those scoring high in the area of knowledge have more proper, or less

improper, clinical practices. This is seen in the graph in Figure 4 in the upward trend in clinical practices scores among the high knowledge scorers. Those subjects with low to moderate knowledge scores had clinical practices scores which were within a similar range.

Higher knowledge scores on a basic test of ten questions on the etiology, epidemiology, diagnosis, and treatment of testicular cancer were significantly related to more proper, or less improper, clinical practices on the part of the health care practitioner reflected in higher scores on four clinical case studies questions. This positive relationship shows that knowledge is a factor in improving the practices of clinicians; i.e.,: higher knowledge levels are a factor in more proper, or less improper, clinical practices. Those practitioners with the highest knowledge levels have the best clinical practices.

Although knowledge explained only 4% of the variance, it is a statistically significant factor impacting clinical practices. It is imperative for the practitioner to have a solid basic understanding of the disease to have a positive impact in the clinical skills arena. Better educated clinicians should improve the clinical evaluation of patients with testicular abnormalities. This will hopefully lead to

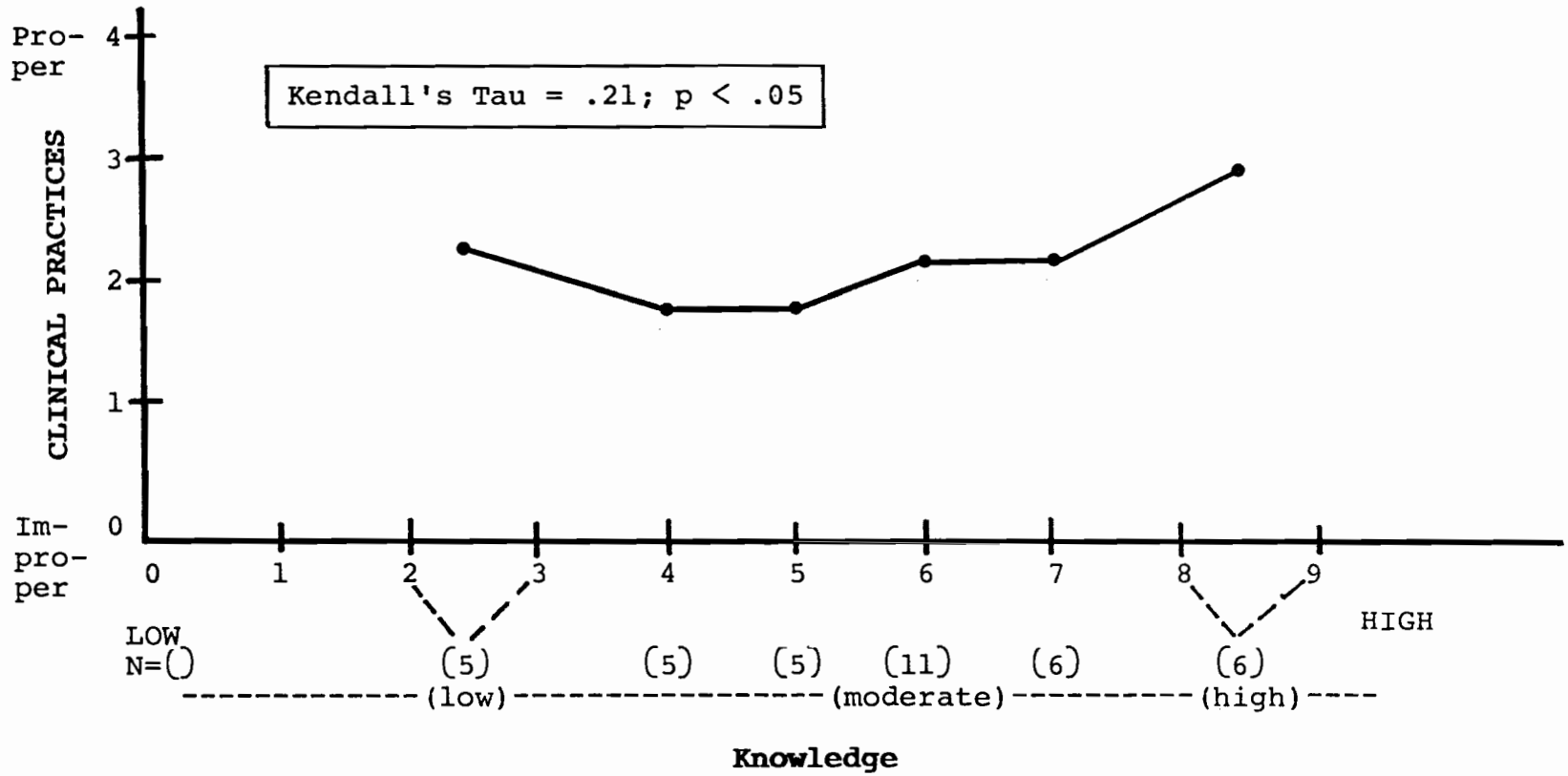

Figure 4. Knowledge scores correlated to clinical practices scores

earlier proper diagnosis of testicular cancer.

Research Question Two

Research question two stated "Are there differences in knowledge levels (scores) on testicular cancer among the practitioners (M.D., N.P., P.A.) studied?"

Mean knowledge test scores computed for the different groups in the study (M.D., N.P., P.A.) are based on a total of ten basic questions on the etiology, epidemiology, diagnosis, and treatment of testicular cancer (See Figure 5). All missing data was handled as an incorrect response, as the object of the study was to measure the number of correct responses by participants.

The mean group test score was six correct out of a possible ten responses. This was a score of 60% and fell into the range of moderate knowledge level. There was no significant difference in knowledge scores among the practitioners studied. A t-test was completed evaluating the M.D. and N.P. groups which were the highest and lowest scoring groups respectively. The point difference was approximately one point out of the ten possible. The t-test was non-significant at $t=1.43$. The t-test was used to evaluate significance in difference in scores because it is a basic parametric procedure used to evaluate the differences in group

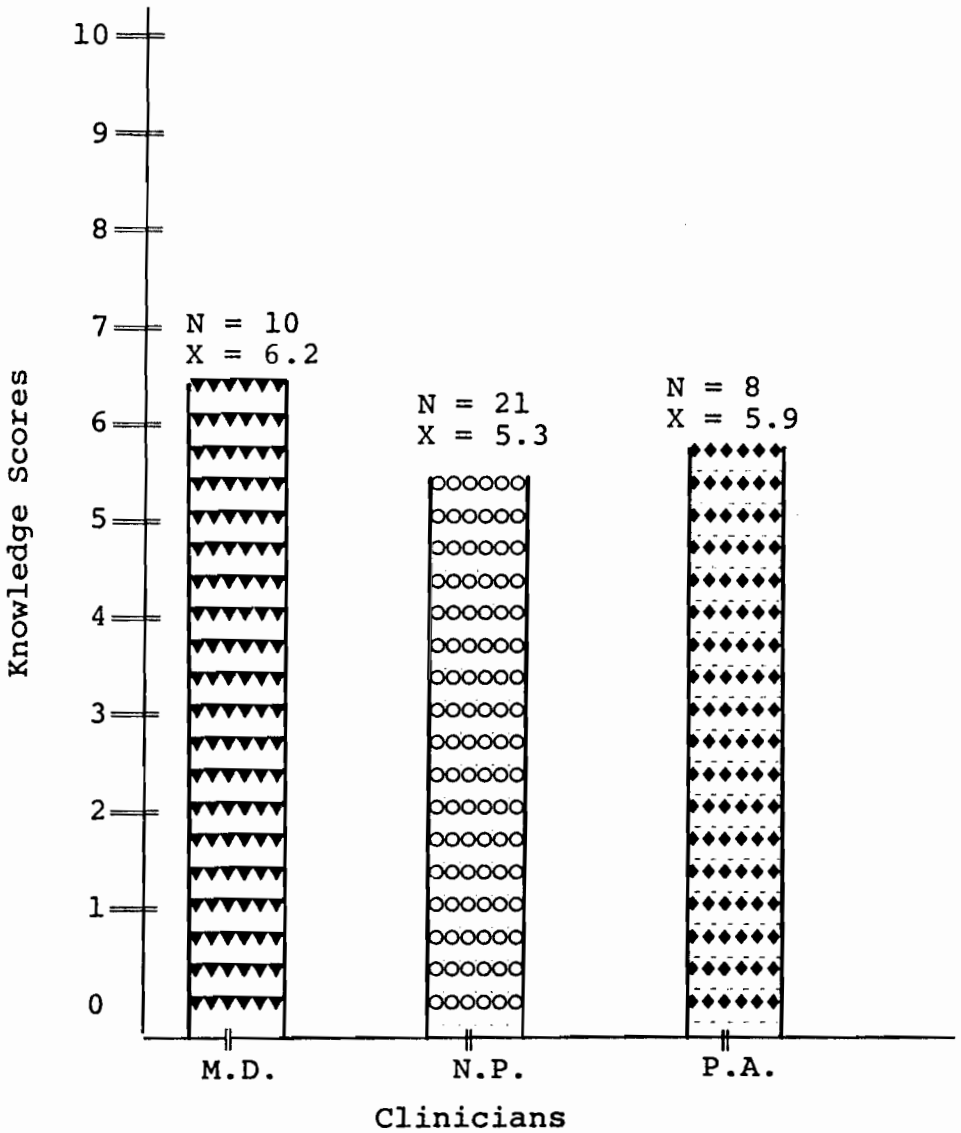

Figure 5. Average knowledge scores of clinicians studied

means of independent samples.

Scores were remarkably similar considering the differences among the three groups in age, year graduated, and years in practice (see Table 4). The M.D. group could be expected to have higher scores based on these factors, mean age 48 years, years in practice, 17.6 years; compared to the mean age of N.P. of 33 years and P.A. of 36 years, the mean years in practice of N.P. of 6 years and P.A. of 4 years. Physicians also have a basic educational background which is longer and richer in theory and clinical practice compared to the one-to-two year program of training of the N.P. or P.A. The N.P. and the P.A. have been out of school for a shorter period and may have more recent recall of this disease entity, as it is quite rare and not seen frequently in a clinical practice. Recent educational literature has emphasized the need for good examination and awareness of the symptoms of testicular concern in patients.

Moderate knowledge levels are most likely due to the lack of dissemination of knowledge on testicular cancer. The disease is of very low incidence and considered quite rare. The increasing incidence over the last few years and affected age group make it imperative that more knowledge be imparted to clinicians. The study exemplifies this urgent need.

Research Question Three

Research question three stated "Are clinical practices related to testicular masses proper or improper?"

The clinical practices scores as evaluated by four clinical case studies were scored from 0-4 points. Scores of 0-3 were representative of improper clinical practices and a score of four represented proper practices. Frequencies were run on the total sample of combined M.D., N.P., and P.A. samples. Eight percent or three practitioners, had proper clinical practices scores. The remaining 92% of the sample, 36 in number, had improper practices scores. (See Table 5) Group mean/scores were examined by using individual scores from 0-4 and not as grouped by improper or proper clinical practices. The mean score was 2 correct out of a possible 4, or 50%. A t-test was computed comparing the clinical practices scores of the M.D. group and the N.P. group, the highest and lowest scoring groups respectively. The M.D. group had significantly higher clinical practices scores than the N.P. group. A t-value of $4.30; p < .0001$ was statistically significant.

These low clinical practices scores indicate that the group as a whole was unable to correctly evaluate

Table 5

Frequency Distribution of Clinical Practice Scores

Clinical Practices	Frequency	%
0 (improper)	2	5
1	9	23
2	14	36
3	11	28
4 (proper)	3	8
Totals	39	100

Note. S.D. = 1.02 $\overline{X}$ = 2.1

the four common types of testicular abnormalities, including testicular tumor, and initiate proper care. Although all scores were low, the physician group scored significantly higher than the N.P. group. Two of the ten physicians evaluated had proper practices and their total scores did not drop below 50% correct. The P.A. group had one correct, or one proper practices score and the total group did not score below 50% correct. The N.P. group had scores ranging from 0-3 with no perfect scores. The higher physician scores could be related to their higher mean age, years in practice, as well as educational background. The physicians had the highest knowledge test scores as well. Although these were not significantly higher than the N.P. and P.A. groups,they may contribute to a better clinical understanding of the disease process.

The literature cites a lack of proper diagnosis and initial treatment of testicular masses by practitioners. This study sample supports this hypothesis. The overall low knowledge levels of the group and the positive relationship of knowledge with clinical practices scores indicates that more knowledgeable practitioners would have better practices relating to testicular masses. Experience seems to have an impact on clinical practices although not significantly on knowledge, as the physician group with a higher number of years in

practice scored significantly higher in this realm.

Research Question Four

Research question four stated, "What are the reasons why practitioners defer testicular examination?"

Deferral practices of clinicians were evaluated by the respondents choices of six responses in the questionnaire which the author judged to be the most common reasons for deferral of testicular examination. Of the total population (N=39), the N.P. group were more likely to defer examination, and for more varied reasons (See Table 6). They cited personal friendship with the patient, the patient's discomfort with the examination and lack of knowledge and discomfort performing testicular examination on their part, as reasons for deferral. The P.A. group cited personal friendship with the patient and their own lack of knowledge as reasons for deferral. One physician cited patient discomfort as a reason for examination deferral.

Overall, the physician and P.A. groups were much less likely to defer examination. This may be due to the fact that the two groups were primarily male, 100% and 88% respectively and slightly more knowledgeable. The physician group was significantly more clinically adept at diagnosis of testicular abnormalities than the nurse practitioners. The physician group also had more

Table 6

Distribution of Practitioner's Reasons for Deferral of Testicular Examination

Reasons for examination deferral by clinicians	M.D.	N.P.	P.A.	Total N
If the patient is a personal friend.	0	9	2	11
Most testicular abnormalities can be diagnosed by history alone.	0	0	0	0
If patient feels embarrassed or uncomfortable with the procedure.	1	5	0	6
I do not know what to feel for.	0	1	1	2
I would not know what to do if I felt something.	0	0	0	0
I feel embarrassed or uncomfortable performing a testicular examination.	0	5	0	5
Totals	1	20	3	24

years of clinical experience than the two other groups. Nurse practitioners may evaluate personal and interpersonal factors more often than the other two groups due to an educational background which is sensitive to a holistic view of the patients' physical as well as psychological, well being. Perhaps the nurses sensitivity and lack of reluctance to press forward with an uncomfortable examination procedure reflects this aspect of their training. It may also reflect their different level of clinical skill as compared to the physicians.

Deferral of testicular examination, or incomplete examination on the part of the health practitioner leads to poor evaluation of clinical cases of testicular masses. Nurse practitioners need to retain their sensitivity while realizing the importance of the examination to the diagnosis of testicular cancer and the impact improper examination of the patient makes on diagnosis.

Research Question Five

Research question five stated, "How do knowledge levels (scores) relate to attitudes about specific issues relating to diagnosis and treatment of cancer and testicular cancer?"

Eight separate attitude statements on different

aspects of diagnosis and treatment of cancer in general and testicular cancer were presented for participant rating on a Likert-type scale. These ratings were correlated with mean group knowledge scores using Kendall's tau correlation matrix. The standardized alpha correlation score, or degree of relatedness between individual variables,was expectedly low at .64 due to the great content difference among the statements. The statements were not meant to be evaluated as a group, but individually with knowledge scores as in Table 7.

Two of the statements were significantly positively correlated with knowledge scores. This indicated that positive attitudinal postures on these items related to high knowledge levels. Knowledge correlated with positive response to the statement, "Early diagnosis of cancer leads to better prognosis" and was significant at a tau value of .27; $p < .03$,as was the statement, "It is helpful for men to examine their testicles routinely for testicular abnormalities" at a tau of .24; $p < .05$. All other statements had non-significant relationships with knowledge scores.

General ratings of the total group towards these attitudinal items were very positive (see Table 8). The highest number of practitioners fell into the strongly agree or agree rating categories indicating positive attitudinal postures for all items except the statement,

Table 7

Correlation of Knowledge Scores With Individual Attitudinal Variables

Attitudinal Variables	Tau Value	Significance
Early diagnosis of cancer leads to better prognosis.	.27	$p < .03$
Self-examination techniques such as BSE and TSE should be taught to all patients.	.20	N.S.
If you suspected you had cancer, you would seek treatment.	.14	N.S.
It is helpful for men to examine their testicles routinely for testicular abnormalities.	.24	$p < .05$
Testicular cancer is curable even in its advanced stages.	.07	N.S.
Early diagnosis of testicular cancer improves the patients prognosis.	.14	N.S.
I feel comfortable performing a testicular examination.	.03	N.S.
Health practitioners should teach patients how to perform monthly testicular self-examination.	.10	N.S.

Table 8

Distribution of Attitudinal Ratings of Practitioners

Attitudinal Variable	S/A	A	U	D	S/D	M.D.	Total N.
Early diagnosis of cancer leads to better prognosis.	33	6					39
Self-examination techniques such as BSE, TSE should be taught to all pts.	29	7	1			2	39
If you suspected you had cancer, you would seek treatment.	32	5	1		1		39
It is helpful for men to examine their testicles routinely for testicular abnormalities.	27	11	1				39
Testicular cancer is curable even in its advanced stages.	3	6	15	10	1	2	39
Early diagnosis of testicular cancer improves the patient's prognosis.	28	8	3				39
I feel comfortable performing a testicular examination.	17	14	6	2			39
Health practitioners should teach patients how to perform monthly testicular self-examination.	20	15	4				39

Note. S/A=strongly agree, A=agree, U=undecided, D=disagree, S/D=strongly disagree, M.D.=missing data.

"Testicular cancer is curable even in its advanced stages" which had a majority of responses in the undecided and disagree categories.

The total sample of practitioners valued the early diagnosis and treatment of cancer in general, but not the curability of certain stages of testicular cancer. This negative attitudinal posture held by these practitioners can impact their eagerness to refer patients for treatment and support of therapy for all stages of testicular cancer. Knowledge related significantly with two of the eight items indicating that it does not impact attitudinal postures about all aspects of detection and treatment. Other variables must be responsible for these attitudinal postures. It is important to know that knowledge affects even certain attitudes; however, it also impacts clinical practices and can alter patient treatment outcomes through these relationships.

Research Question Six

Research question six stated, "To whom do practitioners refer patients with suspicious testicular masses?"

Study participants were asked what type of a specialist to whom they would refer should they have a suspicious testicular finding in a patient. Eighty-

seven percent (N=34) stated a urologist, five percent (N=2) a medical oncologist, five percent (N=2) chose a general surgeon, and three percent (N=1) chose both a urologist and a medical oncologist. The physician group referred to a urologist 100% of the time, as did the P.A. group. The nurse practitioner group chose a urologist 76% of the time, a general surgeon or medical oncologist 9.5% of the time and a combination of a urologist and medical oncologist 5% of the time. (See Table 9.)

The preference among the physician and physician assistant groups for referral to the urologist may reflect a similarity in thought process due to training in the same medical model philosophy and perhaps a more knowledgeable approach to the clinical problem of testicular masses.

Research Question Seven

Research question seven stated, "What percent of practitioners value the use and teaching of testicular self-examination to patients?"

Practitioners were asked to evaluate three attitude statements among a set of eight on a Likert-type scale. These statements related to the value of use and teaching of testicular self-examination to male patients. Ninety-seven percent of practitioners felt self-examination

Table 9

Distribution of Referral Choices of Practitioners

Practitioner	Referral N=39	%	N
M.D.	Urologist	100%	10
N.P.	Urologist	76%	16
	General Surgeon	9.5%	2
	Medical Oncologist	9.5%	2
	Urologist/Medical Oncologist	5%	1
P.A.	Urologist	100%	8

techniques should be taught to all patients. Three percent were undecided. No practitioners were in disagreement. Ninety-seven percent of practitioners surveyed felt testicular self-examination (TSE) was helpful for male patients to perform monthly. Three percent were undecided. No practitioners disagreed. Ninety percent of practitioners studied felt they should teach the technique of testicular self-examination (TSE) to their patients. Ten percent were undecided and no practitioners disagreed (see Table 10).

The responses to these questions show a very strong positive regard for the value and teaching of self-examination techniques and testicular self-examination (TSE), in general, among practitioners. Patient teaching about testicular cancer detection has been recommended by several sources as a method for improving early diagnosis. Positive attitudinal postures among practitioners can only foster this premise.

Table 10

Percent of Practitioners Valuing Use and Teaching of Testicular Self-Examination

Statement	S/D	D	U	A	S/A	Totals
Self-examination techniques such as BSE, TSE should be taught to all patients.			3%	19%	78%	100
			N=1	N=7	N=29	N=37
It is helpful for men to examine their testicles routinely for testicular abnormalities.			3%	29%	68%	100
			N=1	N=11	N=26	N=38
Health practitioners should teach patients how to perform monthly testicular self-examination.			10%	39%	51%	100
			N=4	N=15	N=20	N=39

Note. S/D=strongly disagree, D=disagree, U=undecided, A=agree, S/A=strongly agree.

CHAPTER IV

SUMMARY AND IMPLICATIONS FOR NURSING

Physicians, nurse practitioners and physician assistants practicing in Salt Lake City, Utah and affiliated with the professional organizational group of their discipline served as the sample for the investigation of knowledge levels, attitudes, and clinical practices of practitioners on testicular masses. Thirty-nine respondents from a total population of 105 completed and returned a 28 item questionnaire designed to evaluate clinician's knowledge levels, attitudes, and clinical practices on the subject of testicular cancer. The primary focus of this investigation was to determine whether the factors of practitioner knowledge and attitude affected ability to properly diagnose and institute intervention for testicular masses, specifically testicular cancer.

Descriptive and correlational analysis of findings showed that knowledge level on testicular cancer among practitioners was moderate. Practitioners had a command

of 60% of the basic facts on the etiology, epidemiology, diagnosis, and treatment of testicular cancer. All groups (M.D., N.P., P.A.) scored within the same range and there were no significant differences in scores.

Attitudes of practitioners on the early detection of cancer and specifically testicular cancer, and treatment of cancer in general were positive. All groups agreed that methods of treatment and early detection were helpful to patients. The group exercised more negative views on the treatability of all stages of testicular cancer. Findings indicated a hesitancy in regards to optimistic views about treatment for testicular tumors.

Total clinical practices scores were improper for the majority (92%) of the sample. Those clinicians with the highest clinical practices scores also had higher knowledge scores. Those with positive attitudes on two of the eight attitudinal measures also had high knowledge scores.

Referral choices on the whole were correct and the nurse practitioner group was the most common group to defer testicular examination for multiple interpersonal reasons. The general sample valued the use and teaching of testicular self-examination to patients, responding favorably to items on a Likert-type scale.

This study showed a lack of basic knowledge and proper clinical skills among the practitioners evaluated. It demonstrated that knowledge was one significant factor in proper practice performance and individual (item) attitudinal postures of the practitioner. It supported the literature's assumption of a lack of knowledge and poor practices among health care providers in relation to testicular masses. Attitudes, by far the most difficult factor to alter, were generally positive. It produced a clear discrepancy wherein the majority of respondents had moderate knowledge levels and improper clinical practices; they had positive attitudinal postures toward the benefits of performing and teaching testicular self-examination to patients and felt comfortable in performing testicular examination on patients. This finding adds a level of doubt to the efficacy of educational solutions for the problem of low knowledge levels and improper clinical practices in practitioners. It appears that the practitioners have an unrealistic view of their abilities in comparison to their actual knowledge base and clinical accumen. It therefore may be quite difficult to engage health care providers in continuing education programs due to the fact that they themselves do not view this as a need. Measures should be undertaken to distribute the findings of this study to the general

health practitioner in order to educate them about their need for further education. Development of continuing education programs should be accompanied by input from the health care provider to mold a program which would be palatable to the participants.

Implications for future research lie in meeting the problem outlined prior to the practitioner's entry into practice. Evaluation of program curriculum of medical schools, nurse practitioner programs, and physician assistant programs would clarify insufficiencies in the teaching of physical examination and physical diagnosis of testicular abnormalities to students and provide solutions for change. It is much easier to affect change and transfer information to the student than it is to the already confident, although misinformed, practicing care-giver. Changes could also be instituted through identification of other factors in addition to knowledge which affect clinical practices.

Small sample size and a large difference in the number of care providers in each subgroup in this study sample make generalizability of these findings difficult, as the results could have occurred due to these factors. The rarity of testicular cancer and the very small number of cases seen by the general practitioner in a lifetime of practice may make the results appear less important to the observer and may have affected the

respondent's scores as well. The conceptual model used in this study is generalizable and could be used as a model for future studies evaluating the patient care outcomes of practicing health care providers on many different health care topics. The implications of findings in this study as they relate to the practice of nursing fall into the realms of clinical practice and research. Many young men could be spared needless time lapse and inappropriate diagnostic procedure leading to poorer prognosis through better educated practitioners who have proper clinical practices toward testicular masses.

Nursing is expanding its role to include basic general health care to patients and the clinical implications for practice on testicular abnormalities have far ranging implication. Increasingly it is the nurse practitioner who performs the physical examination on the patient presenting for a general check-up or specific acute complaint. Nurse practitioners are also great proponents of the benefits of preventive care and self-care. They are in an ideal position to do patient teaching on testicular cancer and testicular self-examination in offices, schools, and clubs. Nurses have always been teachers for the interdisciplinary team and their input on this subject could alter care patterns

of other clinicians through teaching and example setting in practice. More and more nurses are joining committees of professional societies and have input into their continuing education programs, such as the American Cancer Society, being in a position to influence practitioner education and public dissemination of information.

Research is an important aspect of the discipline of nursing. Although the clinical implications in this study are more for teaching, future studies on the subject of testicular cancer in relation to nursing practice are well warranted. There is a need to evaluate curriculum and factors affecting practices in an attempt to alter the present picture. As the incidence of testicular cancer continues to rise and nurses are more involved in primary care of the patient, the need for evaluation of training programs, content and practicum, will need continual assessment and revision. Innovations instituted by nursing can also affect other disciplines through example. The ultimate goal is healthier patients.

APPENDIX

DATA COLLECTION INSTRUMENT, INFORMED CONSENT FORM AND LETTER OF INTRODUCTION

Questionnaire

Part I: Please fill in the following demographic Information:

Profession:_____Year Graduated:_____

Degree (s):_____

Age: _____Sex:_____

Type of Practice:_____

Years in Practice:_____

Areas of Special Interest:_____

****

Part II:

1. What do you think people consider is the most serious health problem or disease today? (circle one)

   Cancer Heart Disease Mental Illness Other

2. Which number properly estimates the incidence of testicular cancer in the U.S.A.? (circle one)

   20/100,000 5/100,000 2.2/100,000 150/100,000

3. Rates of testicular cancer are decreasing around the world. Is this statement

   True / False

   (circle one)

4. Should some testicular masses be only observed?

   Yes/No (circle one)

   If yes, for how long?

   _____

5. Which disease would worry you most if you had it? (circle one)

   Cancer Heart Disease Mental Illness Other

6. The highest rates of testicular cancer are in: (choose one)

   Black males___ Japanese males___ White males____ Other____

7. Which of these populations is at highest risk for developing testicular cancer? (choose one):

   Son of a man with a history of testicular cancer _____

   15-35 year old black male_____

   Young, 22 year old with a history of cryptorchidism repaired at age 7_____

8. The age group affected most often by testicular cancer is: (choose one)

   infant to 15 years old____ 15 years old-35 years old_____

   35 years old to 60 years old____

   60 years old and older_____

9. If you refer a patient with a testicular mass, to whom do you refer? (choose one)

   urologist____ radiation oncologist____

   general surgeon_____ medical oncologist_____

10. The most common presentation of a testicular tumor is: (choose one)

    a hard, non-tender testicular mass_____

    a reddened, swollen scrotum and painful testis_____

    a non-tender, atrophic testis_____

11. Under what circumstances do you examine a patient's testicles (choose one):

    With any physical examination for whatever cause____

    In the course of a routine health check_____

    If the patient requests examination_____

12. The most reliable biopsy technique for a testicular mass is: (choose one)

open scrotal biopsy___ transcrotal needle biopsy___

high inguinal biopsy____

13. The greatest risk factor in development of testicular cancer is: (choose one)

radiation exposure to the genitalia as a child___

mumps orchitis____ cryptorchidism_____

14. A careful testicular examination include (s): (choose all that apply)

transillumination____identification of scrotal contents_____

weighing of testis in hand___

patient standing in front of examiner_____

15. Many health practitioners do not feel comfortable examining patients' testicles for abnormalities. For what reason (s) would you defer testicular examination? (choose all that apply)

Patient is a personal friend_____

Most testicular abnormalities can be diagnosed by history alone_____

If the patient feels embarrassed/uncomfortable with the procedure_____

Do not know what to feel for_____

Would not know what to do if something was felt___

I feel embarrassed/uncomfortable doing a testicular examination_____

16. Two tests required for initial laboratory work-up specific to a testicular mass are: (choose two)

alpha-fetoprotein level____sedimentation rate____

SMA-20 chemistry profile_____ (cont. next page)

16. Continued

human chorionic gonadotrophin level_____

Please Rate The Following Statements:
(Check the square that most closely approximates your feelings regarding the statement)

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
17. Early diagnosis of cancer leads to better prognosis.					
18. Self examination techniques such as SBE, STE should be taught to all patients.					
19. If you suspected you had cancer, you would seek treatment.					
20. It is helpful for men to examine their testicles routinely for testicular abnormalities.					
21. Testicular cancer is curable (even in its advanced stages).					

	Strongly Agree	Agree	Un-decided	Dis-Agree	Strongly Disagree
22. Early diagnosis of testicular cancer improves the patient's prognosis.					
23. I feel comfortable performing a testicular examination.					
24. Health practitioners should teach patients how to perform monthly testicular self-examination.					

Part III

Choose the one most appropriate answer for each of the four case presentations:

25. A 36 year old unmarried man had no symptoms, but is concerned about an abnormal area in his left hemiscrotum. It has been present as long as he can remember, but may be getting a little larger. Examination shows a mass in the left spermatic cord which has the feel of a "bag of worms" and is non-tender, but increases in size with standing or Valsalva. The inguinal ring is intact and no bulge detected. The testis itself is somewhat small but non-tender and without masses.
(Please turn to page 92 for answer choices).

Treatment Should Be:

___1. Reassurance only

___2. Inguinal exploration and removal of probable slow growing sarcoma.

___3. Inguinal hernia repair.

___4. Percutaneous drainage.

26. A 17 year old boy has a history of a non-painful mass in his left testis. He is not sure how long it has been present, but he only noticed it one week ago. He underwent bilateral inguinal hernia repair and orchiopexy at two years of age and has had no symptoms or problems since then. He is not aware of any specific trauma, but is on the high school football team. Exam shows the testis to be approximately two times the normal size with a firm, non-tender mass in it which does not transilluminate. The epididymus is difficult to distinguish.

The Next Step Should Be:

___1. Inguinal exploration with possible orchiectomy.

___2. Transcrotal biopsy with a small, non-traumatic needle.

___3. Broad spectrum antibiotics

___4. Followup examination in one month as this is likely scarring from his previous surgery or related to trauma.

27. A 24-year old man presents with a two day history of severe right testicular pain and tenderness. Past history is unremarkable and there is no history of trauma. Examination shows the right hemiscrotum to be enlarged, warm and exquisitely tender. The testis is difficult to palpate or distinguish because of tenderness. Urinalysis shows occasional WBC's. Temperature is 99^2.

Treatment Should Be:

(answers on page 93)

____1. Transcrotal biopsy

____2. Inguinal exploration and possible orchiectomy

____3. Broad spectrum antibiotics and be certain patient returns for a followup examination when the inflammation subsides.

____4. Infiltration of spermatic cord with xylocaine to allow a better examination.

28. A 72 year old man has a left scrotal mass which fluctuates in size, but does not seem to be enlarging and is asymptomatic. Examination shows a round, smooth, non-tender mass in the left scrotum approximately five by six centimeters in size. The mass transmits light from a flashlight and an inguinal hernia is not palpable.

Treatment Should Be:

____1. Transcrotal aspiration and drainage

____2. Operative repair

____3. Inguinal orchiectomy

____4. Reassurance and followup examination

This questionnaire is designed to evaluate factors related to diagnosis of testicular masses by family physicians, nurse practitioners and physician assistants in Salt Lake City. The study is part of the requirements for my Masters Degree in Nursing and will be helpful in evaluating the need for professional education on testicular abnormalities. I would appreciate prompt, honest answers. A stamped and addressed envelope is included for return of the completed questionnaire.

Thank you for your help with this project. If you are interested in the results, indicate this at the end of the questionnaire and I will fill you in.

Cheryl Berenson 947 Military Dr. SLC, Ut. 84108

Informed Consent

I understand that this study is aimed at evaluating factors relating to diagnosis of testicular masses by physicians, nurse practitioners and physician assistants.

I realize that I will be asked to answer a questionnaire consisting of 28 questions. The time required to complete the questionnaire should be approximately twenty minutes.

I further understand that all information obtained in this questionnaire will be kept strictly confidential through coding of information. Questions or comments regarding the study may be referred to the author,

Cheryl Berenson for response. I understand that if I do not wish to participate or wish to withdraw from the study at any point I may do so without prejudicial consequences.

I hereby agree to participate in this study.

Signature of the Subject_____

Date_____

LDS HOSPITAL
A Major Referral Center
325 Eighth Ave.
Salt Lake City, Utah 84143
(801) 350-1146

Radiation Center
Oncologists, Inc.
Henry P. Plenk, M.S., M.D.
William T. Sause, M.D.
John W. Thomson, M.D.
Medical Physicist,
David C. Matthes, M.S.

Dear

Mrs. Berenson is a registered nurse in the Master's Program at the University of Utah. She is attempting to evaluate the management of newly discovered testicular masses. As part of her evaluation, she is requesting the completion of a questionnaire. The American Cancer Society would appreciate any assistance that you can give her in completing this project. These projects are one way the Professional Education Committee of the American Cancer Society can evaluate our educational efforts. The results of the study will be available to all who participate.

I appreciate your help.

Sincerely,

William Sause, M.D.
Radiation Oncologist
Director - Professional Education Committee - American Cancer Society.

WS/mg

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